

1970

**OPERATING
SUMMARY**

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ONTARIO WATER RESOURCES COMMISSION

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HUNTSVILLE

water pollution control plant

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ONTARIO WATER RESOURCES COMMISSION

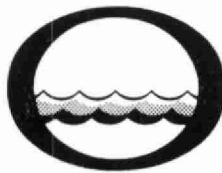
Division of Plant Operations

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Water management in Ontario

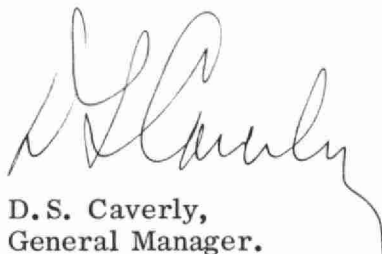
Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario


Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.



D. S. Caverly,
General Manager.



D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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water pollution control plant

operated for

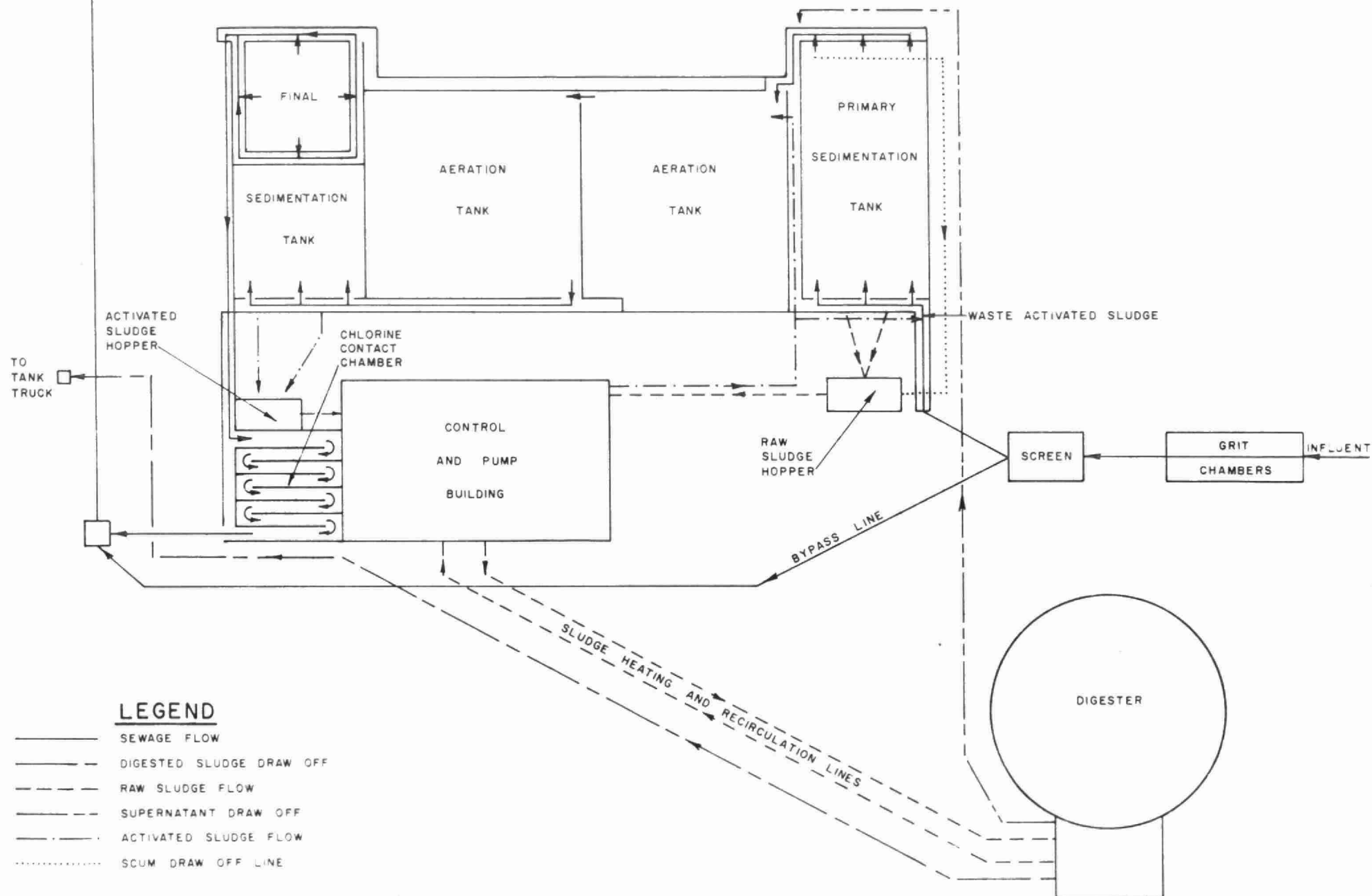
THE TOWN OF HUNTSVILLE

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY

HUNTSVILLE WATER POLLUTION CONTROL PLANT FLOW DIAGRAM



DESIGN DATA

PROJECT NO.	2-0015-58	TREATMENT	Activated Sludge
DESIGN FLOW	0.25 mgd	DESIGN POPULATION	3,000
BOD - Raw Sewage	250 mg/l	SS - Raw Sewage	250 mg/l
- Removal	90-95%	- Removal	90-95%

PRIMARY TREATMENT

Grit Removal

Type: Manually cleaned channels
 Size: Two 10' x 1'7" x 3'4"
 (2 x 52½ cu ft)
 Velocity: 0.99 fps

Screening

Type: Manually cleaned bar screen

Primary Sedimentation

Type: United Steel Corp.
 Size: One 30' x 10' x 8' (15,000 gal)
 Retention: 1.5 hr
 Loading: Surface, 833 gal/ft²/day
 Weir, 25,000 gal/ft/day

SECONDARY TREATMENT

Aeration Tanks

Type: Mechanical aeration
 Size: Two 24' x 24' x 12' (87,500 gal)
 Retention: 8.4 hr

Aerators: Chicago Pump (2)

Secondary Sedimentation

Type: United Steel Corp.
 Size: One 30' x 13' x 12' (29,300 gal)
 Retention: 2.8 hr
 Loading: Surface, 640 gal/ft²/day
 1 Weir, 5,300 gal/ft/day

CHLORINATION

Type: W & T
 Size: One 20 lb/day

Chlorine Contact Chamber

Size: One 12' x 11½' x 10' swd
 (6,250 gal)
 Retention: 36 min

OUTFALL

- 105' of 15" corrugated pipe to Muskoka River

SLUDGE HANDLING

Digestion System - Single-stage

Type: Mixed by recirculation, Fairbanks-Morse, 100 gpm @ 40' tdh
 Size: One 30' dia x 20' swd (15,000 cu ft or 93,500 gal)
 Loading: 1.2 lb/cu ft/mo

PUMPING STATIONS

Pumping Station #1

Type: Chicago Pump
 Size: Two 290 gpm

Pumping Station #2

Type: Chicago Pump
 Size: Two 80 gpm

Pumping Station #3

Type: Chicago Pump
 Size: One 80 gpm

'70 REVIEW

FLOWS	DAILY FLOW mil gal	OCCURRING IN THE MONTH OF	MONTHLY FLOW mil gal	OCCURRING IN THE MONTH OF
Average	.34	—	10.2	—
High	.60	October	13.4	April
Low	.10	Jan. - Feb.	8.5	June

GENERAL

The project consists of a 250,000 gallon per day secondary treatment plant and three pumping stations, as well as two Town-owned pumping stations. The plant was operated by a chief operator, assisted by a town employee whose salary is not included in the operating costs. The staff carried out regular inspections and maintenance of the pumping stations and sewer system.

The plant operated above its design hydraulic capacity most of the time. The firm of R. V. Anderson Associates Limited was engaged during the year to carry out a study regarding the future sewage requirements of the Town.

EXPENDITURES

The total operating cost for the year was \$19,268.31 compared to \$14,146.12 in 1969. The 1970 cost included \$1,385.65 for taxes which in previous years had been paid by the Town. Increases occurred in the salary, power, repairs and maintenance and sludge haulage items.

PLANT FLOWS and CHLORINATION

A total of 123.1 million gallons was recorded as being treated during the year. The average daily flow for the year was 340,000 gallons per day compared to 290,000 gallons in 1969. The design flow of 250,000 gallons per day was exceeded approximately 75% of the time. It should be noted that the flow recorder was not functioning properly during January and February. There was a considerable amount of surface water being treated.

A total of 4120 lbs. of chlorine was used during the year to disinfect the final effluent at an average dosage of 3.3 mg/l.

PLANT EFFICIENCY

The raw sewage had an average strength of 138 mg/l BOD and 201 mg/l suspended solids. It should be noted that high values for suspended solids were recorded in the month of March.

The final effluent had an average concentration of 10 mg/l BOD and 15 mg/l suspended solids. The average concentrations for the year of both the BOD and suspended solids were within the OWRC objective of 15 mg/l for final effluents although at times they exceeded these objectives. The average reduction in BOD was 92 percent and in suspended solids was 92 percent.

An estimated 537 cubic feet of grit was removed, representing an average of 4.4 cubic feet removed per million gallons treated. This value is above normal and is a further indication of surface water entering the system.

AERATION

Air is supplied via mechanical mixers and therefore cannot be measured. The primary effluent had an average concentration of 126 mg/l BOD and the average concentration of the mixed liquor suspended solids was 791 mg/l. The average F/M ratio was 0.61, or 61 pounds of BOD per 100 pounds of MLSS.

SLUDGE DISPOSAL

An estimated 298,300 gallons of raw sludge was pumped to the digester. A total of 334,200 gallons of digested sludge was removed by tank truck.

CONCLUSIONS

The plant is operating above its hydraulic design load, but is treating a weak sewage as a result of dilution by surface water. The average final effluent is within the OWRC objective for BOD and suspended solids.

RECOMMENDATIONS

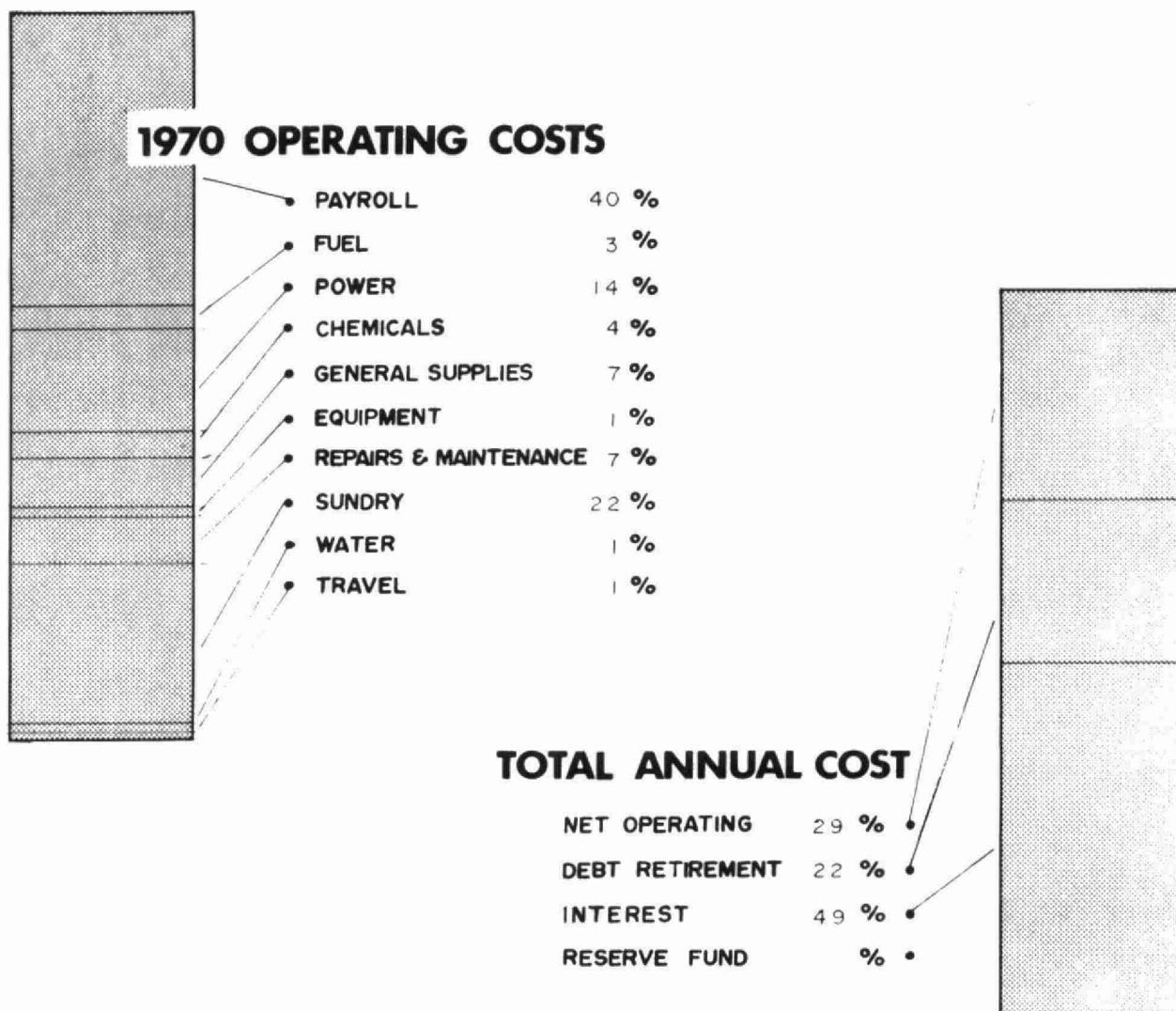
The program of storm water separation should be continued. When R.V. Anderson's report is completed, its recommendations should be reviewed and appropriate action taken particularly with regard to the collection system.

PROJECT COSTS

NET CAPITAL COST (Final)	\$452,388.75
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u> -</u>
Long Term Debt to OWRC	<u><u>\$452,388.75</u></u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	<u><u>\$ 32,148.91</u></u>
Net Operating	\$ 19,316.31
Debt Retirement	15,200.00
Reserve	<u> -</u>
Interest Charged	<u>33,000.00</u>
TOTAL	<u><u>\$ 67,516.31</u></u>

RESERVE ACCOUNT

Balance @ January 1, 1970	\$ 29,464.09
Deposited by Municipality	<u> -</u>
Interest Earned	<u>1,936.71</u>
	\$ 31,400.80
Less Expenditures	<u> -</u>
Balance @ December 31, 1970	<u><u>\$ 31,400.80</u></u>



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	97.47	\$10,925.38	\$112.09	8 cents
1967	83.95	10,947.58	130.40	11 cents
1968	96.72	13,293.28	137.44	10 cents
1969	103.90	14,146.12	136.15	10 cents
1970	123.1	19,268.31	156.50	12 cents

MONTHLY OPERATING COSTS

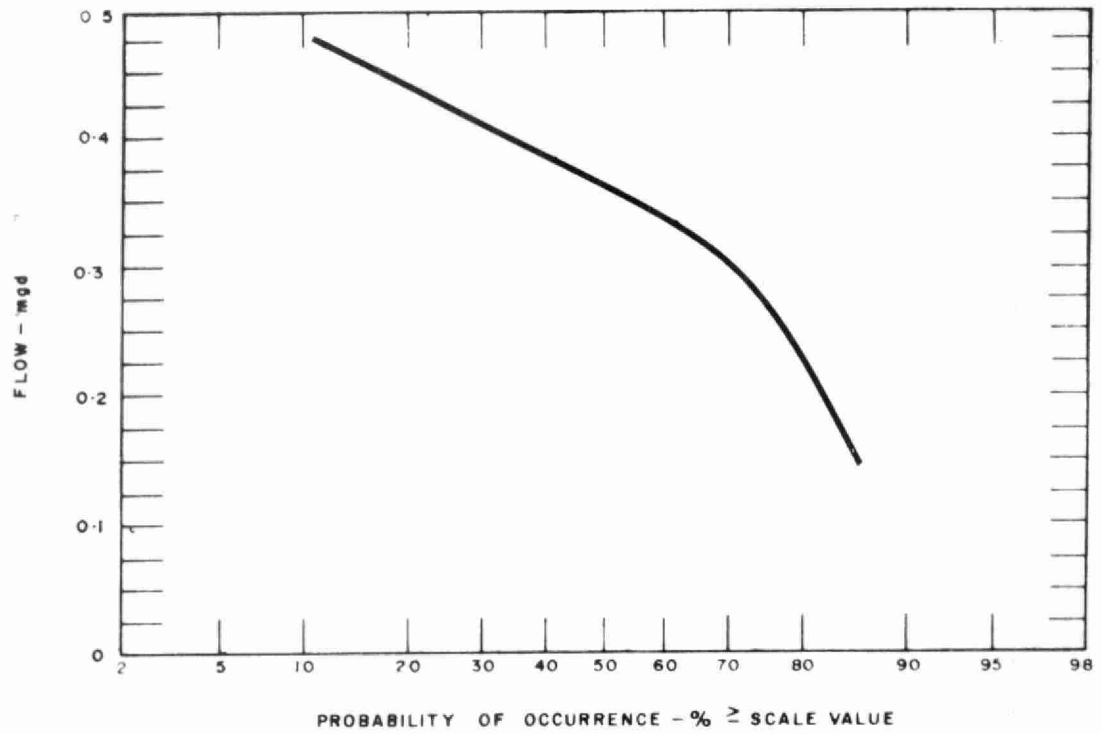
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1211.77	800.70	-	78.60	34.34	-	48.36	-	-	249.77	-	-
FEB	1624.57	586.48	-	135.22	464.95	-	181.88	41.58	12.61	191.40	10.45	-
MAR	1379.11	661.37	-	-	45.27	132.30	69.81	147.06	85.53	237.77	-	-
APR	1166.14	599.31	-	44.10	442.35	-	47.49	-	-	13.99	18.90	-
MAY	1306.16	653.00	-	68.34	39.20	-	155.81	-	26.95	320.77	-	42.09
JUNE	1267.12	605.62	-	53.22	380.85	-	96.21	-	70.00	29.32	31.90	-
JULY	2855.24	577.70	-	62.30	39.20	174.35	96.55	-	75.49	1829.65	-	-
AUG	1501.68	872.47	-	-	312.10	-	39.81	-	76.78	61.97	138.55	-
SEPT	1423.36	591.28	-	25.08	44.60	174.36	119.22	-	-	468.82	-	-
OCT	1496.17	586.88	-	48.08	359.24	-	204.98	-	96.29	147.77	18.80	34.13
NOV	1011.51	645.08	-	-	37.17	174.35	35.92	-	22.00	31.00	-	65.99
DEC	3025.48	586.88	-	68.00	405.87	174.35	171.90	-	931.92	676.96	9.60	-
TOTAL	19268.31	7766.77	-	592.94	2605.14	829.71	1267.94	188.64	1397.57	4259.19	228.20	142.21

BRACKETS INDICATE CREDIT

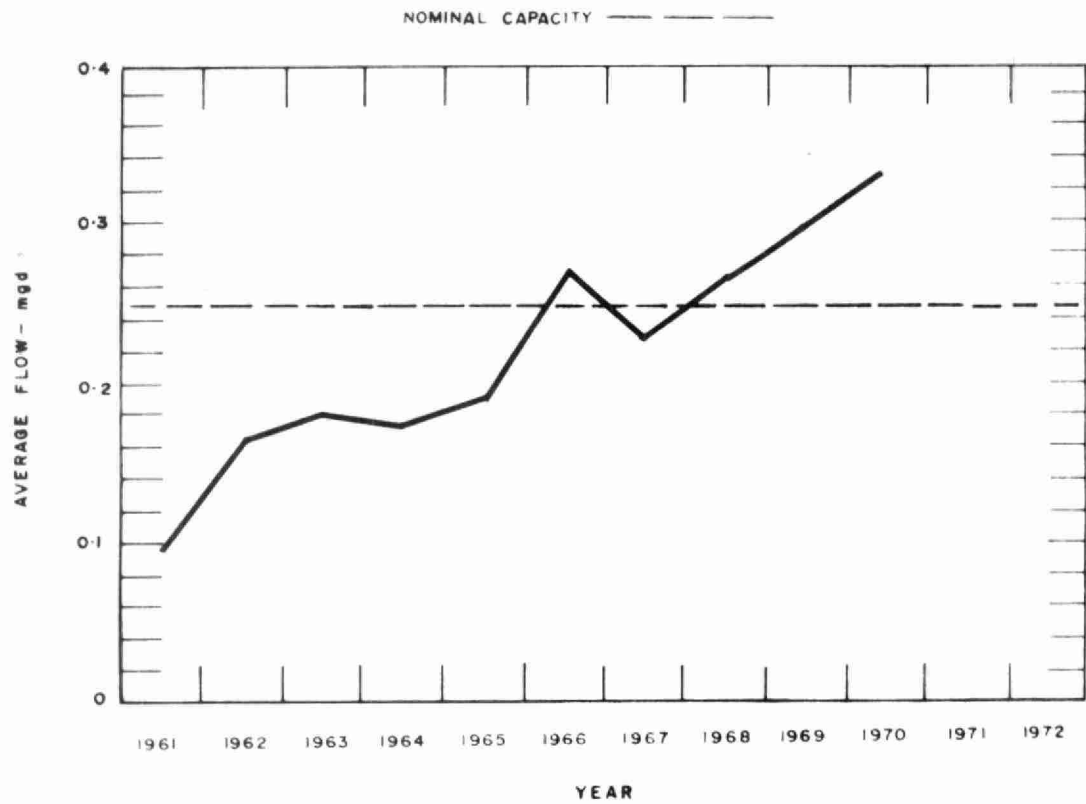
* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$2182.00

Note: Total does not include year-end adjustments.

PROCESS DATA



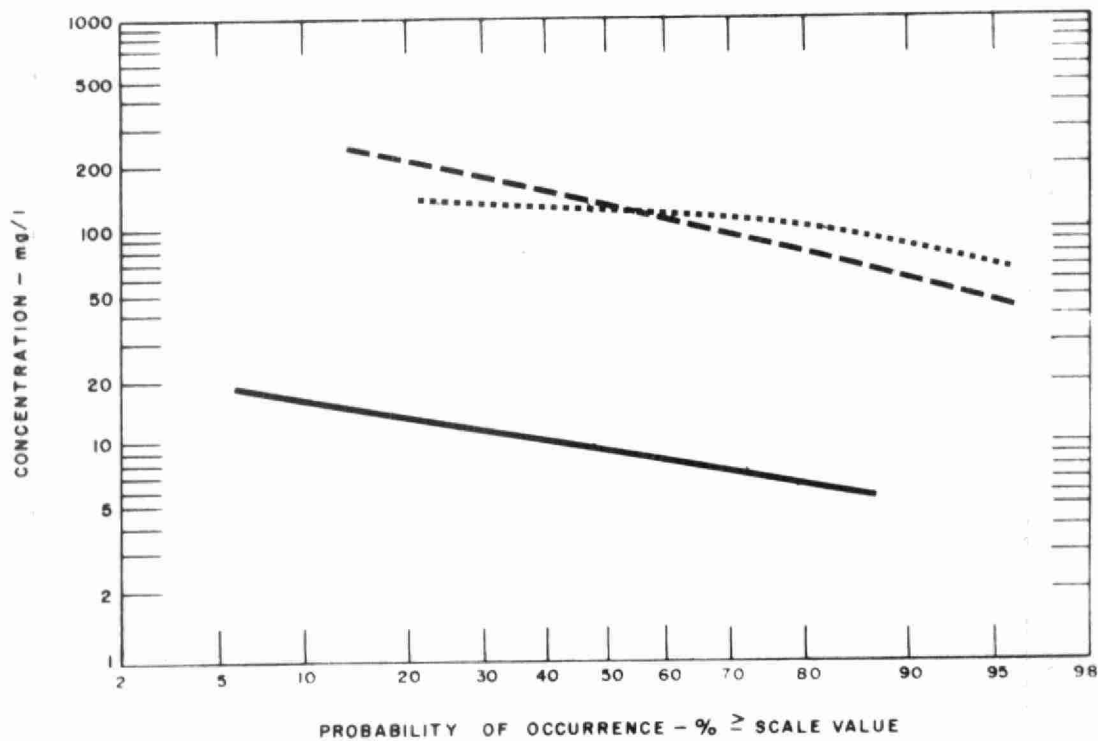
FLOWS



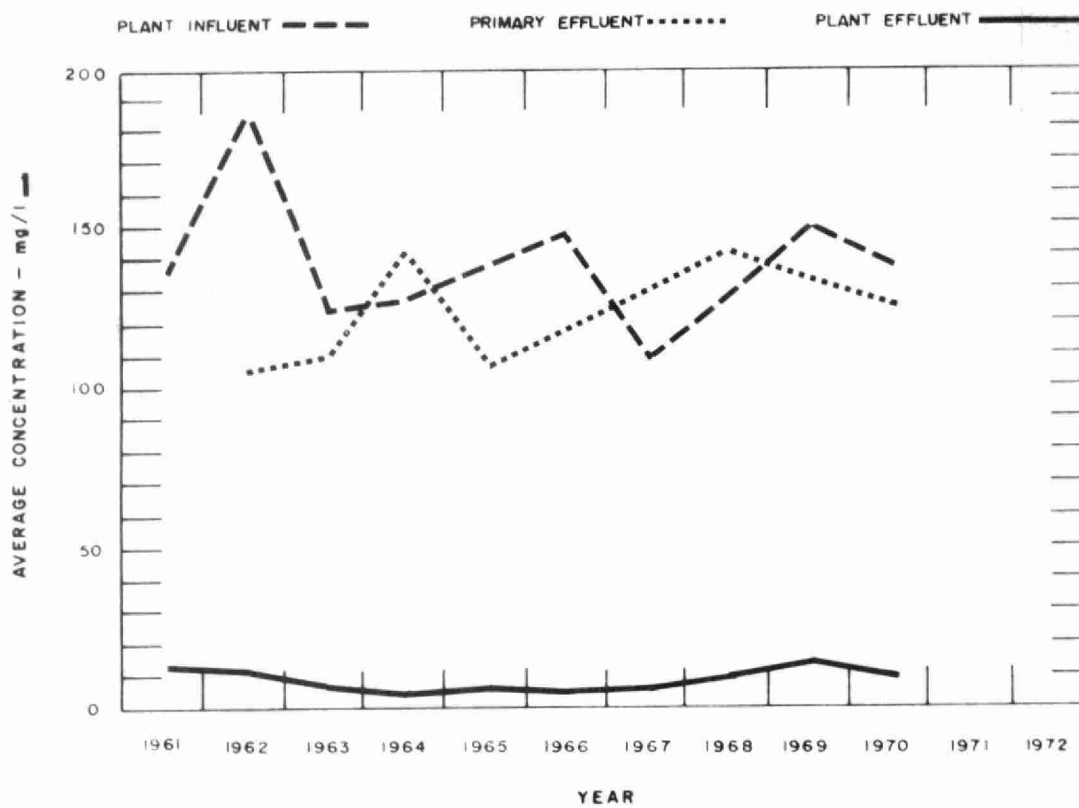
PLANT FLOWS and CHLORINATION

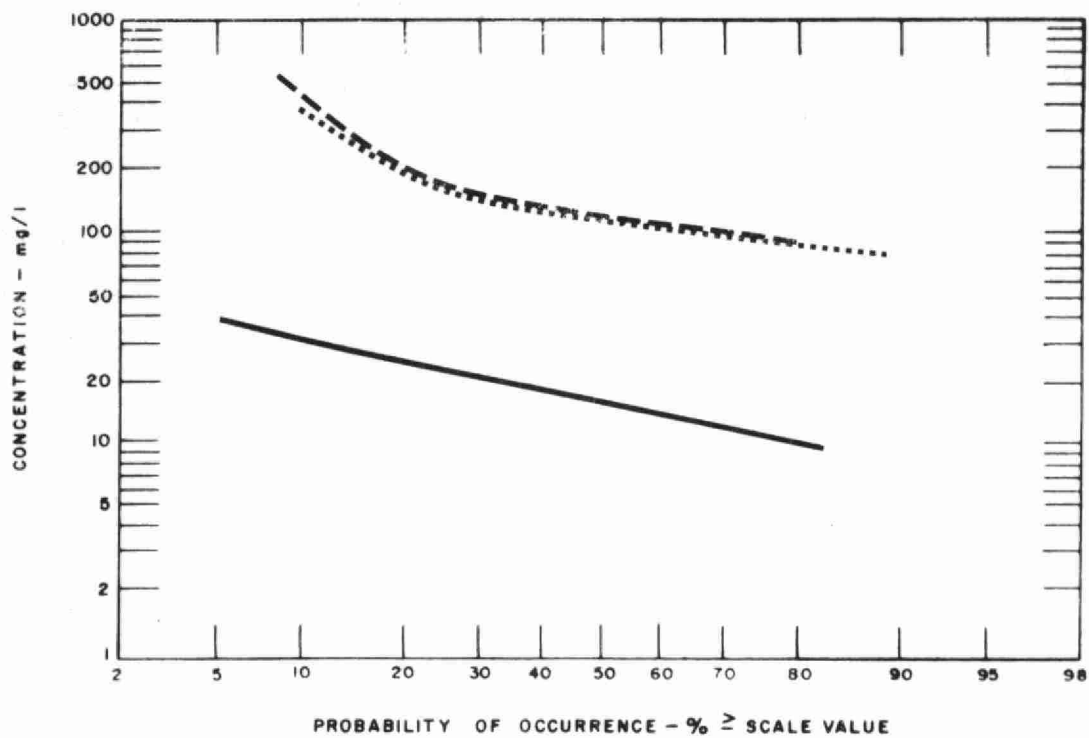
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	4.2*	.13	.2	.1	230	5.4
FEB	4.6*	.17	.5	.1	200	4.3
MAR	11.2	.36	.5	.2	280	2.5
APR	13.4	.45	.5	.2	320	2.4
MAY	11.0	.35	.5	.2	290	2.6
JUNE	8.5	.28	.3	.2	220	2.6
JULY	12.0	.39	.5	.2	540	4.5
AUG	12.2	.39	.5	.2	580	4.8
SEPT	10.7	.36	.4	.2	520	4.9
OCT	12.1	.39	.6	.3	290	2.4
NOV	12.2	.41	.5	.3	320	2.6
DEC	11.0	.36	.5	.2	330	3.0
TOTAL	123.1	-	-	-	4120	-
AVERAGE	10.2	.34	-	-	343	3.3

* Recorder problems

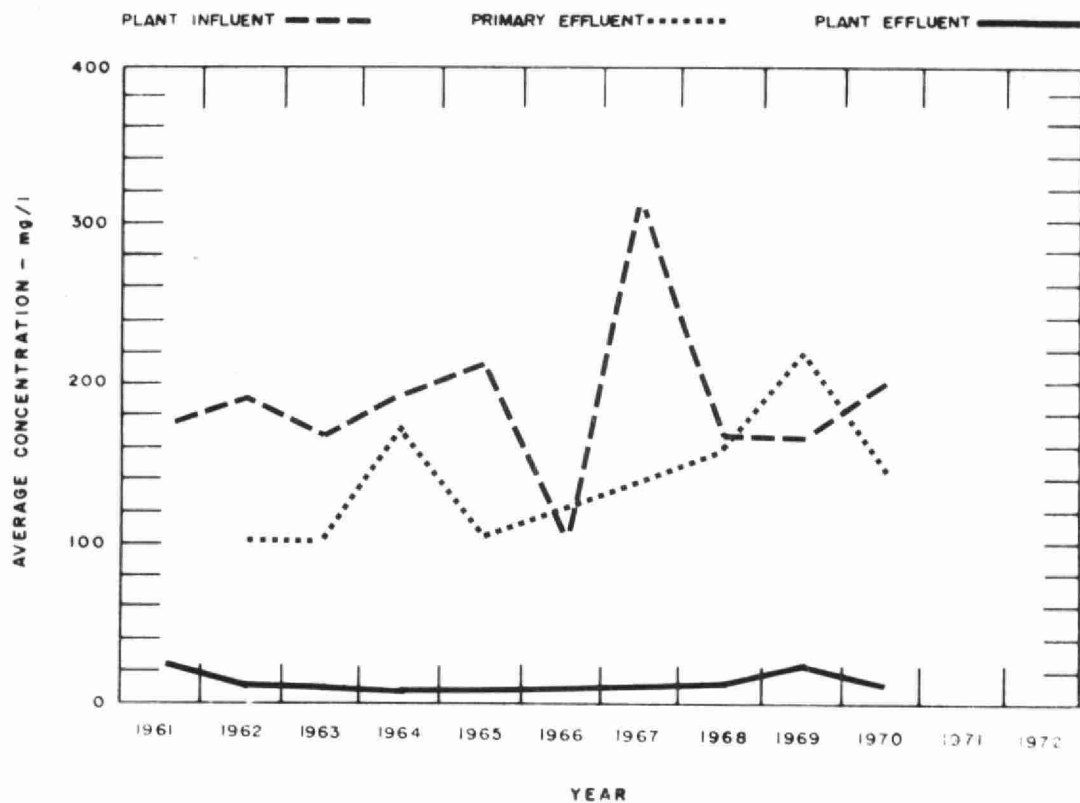


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



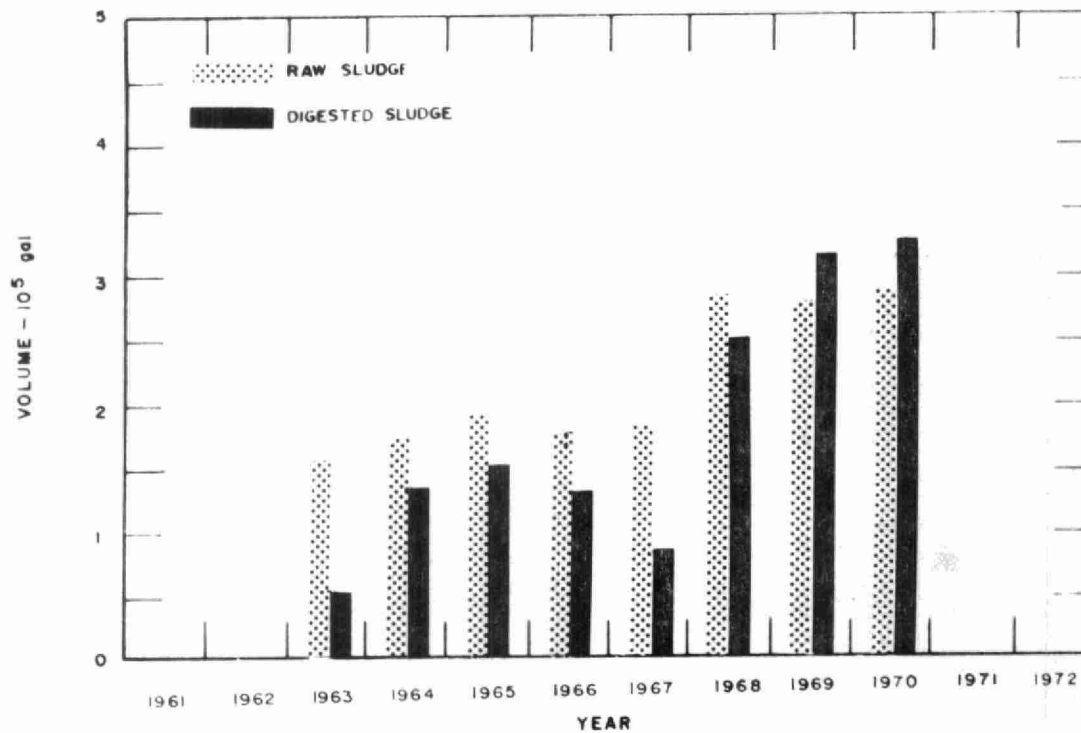
PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED cu ft
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10 ³ pounds	n	mg/l	n	mg/l	%	10 ³ pounds	
JAN	2	125	2	19	85	4.4	2	75	2	13	83	2.6	5
FEB	1	120	1	11	91	5.0	1	140	1	5	96	6.2	6
MAR	2	145	2	9	94	15.4	2	865	2	20	98	94.6	13
APR	2	92	2	12	86	10.8	2	205	2	28	86	23.8	56
MAY	2	120	2	3	98	12.9	2	92	2	8	91	9.3	59
JUNE	1	160	1	7	96	13.0	1	150	1	5	97	12.4	68
JULY	2	109	2	8	93	12.2	2	120	2	13	89	12.9	136
AUG	2	175	2	10	94	20.2	2	92	2	20	78	8.8	48
SEPT	2	165	2	9	94	16.7	2	95	2	10	89	9.0	29
OCT	2	127	2	8	94	14.4	2	95	2	10	89	10.3	64
NOV	2	220	2	9	96	25.7	2	270	2	15	94	31.0	41
DEC	2	100	2	11	89	9.8	2	85	2	20	89	7.1	12
TOTAL	22	-	22	-	-	160.5	22	-	22	-	-	314.1	537
AVERAGE	-	138	-	10	92	13.4	-	201	-	15	92	26.2	45

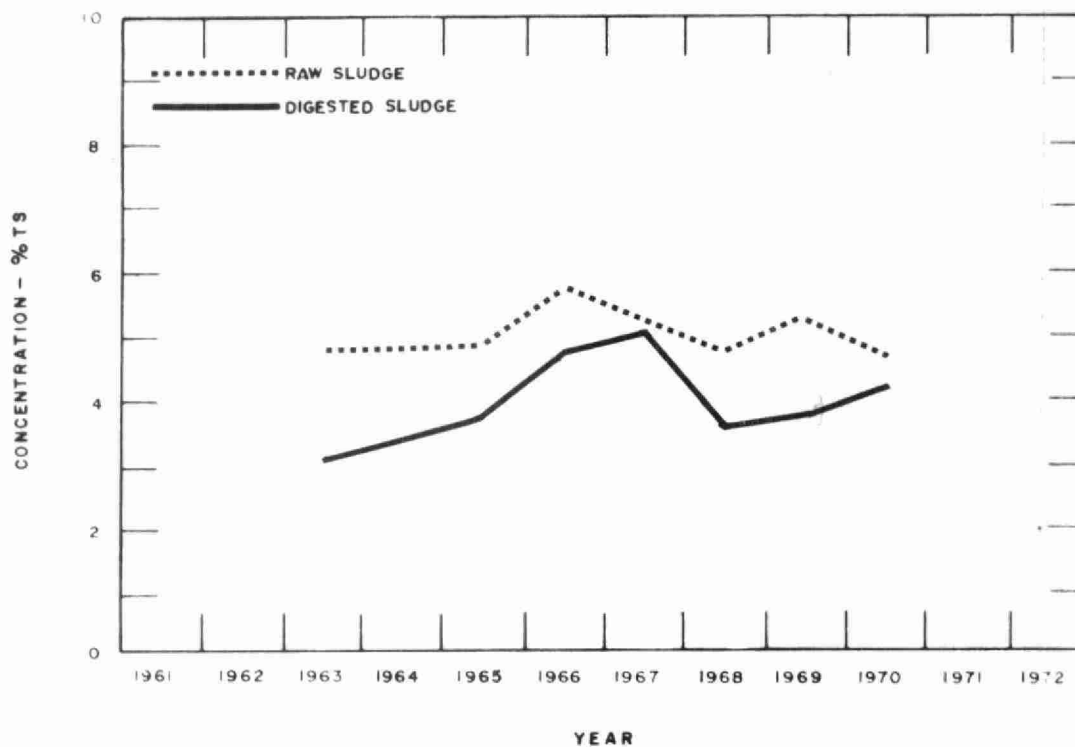
NOTE - n is the number of samples taken

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	mg/l	mg/l	mg/l				
JAN	.13	85	85	13	25	680	0.19	-	-
FEB	.17	200	70	-	-	620	0.63	-	-
MAR	.36	95	142	6	18	795	0.49	-	-
APR	.45	90	250	12	32	1040	0.45	-	-
MAY	.35	90	132	10	10	750	0.48	-	-
JUNE	.28	140	110	9	5	560	0.80	-	-
JULY	.39	140	242	24	20	1000	0.62	-	-
AUG	.39	145	87	14	25	835	0.77	-	-
SEPT	.36	125	95	11	13	900	0.57	-	-
OCT	.39	110	135	12	15	775	0.63	-	-
NOV	.41	160	280	13	20	825	0.91	-	-
DEC	.36	130	120	13	23	715	0.75	-	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.34	126	146	13	19	791	0.61	-	-



DIGESTION



SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10 ³ gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 ³ gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10 ³ gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	23.5	3.0	75	26.4	2.3	55	0	1.1	-	156
FEB	20.2	3.7	76	38.4	1.8	44	0	.2	-	228
MAR	21.7	7.6	37	28.4	4.2	35	0	2.5	-	168
APR	21.9	4.1	42	28.4	10.6	23	0	-	-	168
MAY	29.9	6.8	40	33.4	6.0	30	0	.1	-	198
JUNE	24.6	-	-	39.8	-	-	0	-	-	236
JULY	23.9	5.3	50	23.3	5.4	38	0	.2	-	138
AUG	24.1	4.5	64	23.5	4.5	40	10.6	.4	-	140
SEPT	30.4	5.6	60	19.2	4.7	44	1.8	-	-	114
OCT	30.7	4.6	60	25.3	4.1	44	2.8	.3	-	150
NOV	23.9	4.5	58	24.0	3.9	43	4.0	.3	-	142
DEC	23.5	3.5	58	24.1	2.5	43	2.1	-	-	144
TOTAL	298.3	-	-	334.2	-	-	21.3	-	-	1982
AVERAGE	24.9	4.8	56	27.9	4.5	40	4.2	.6	-	165

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